

## CPP 程式設計題

命題者：ZZY

題目名稱(中文/英文)：Word game

主要測試觀念：

### Basics

- ☒ C++ BASICS 1
- ☐ FLOW OF CONTROL
- ☒ FUNCTION BASICS
- ☐ PARAMETERS AND OVERLOADING
- ☒ ARRAYS
- ☐ STRUCTURES AND CLASSES
- ☐ CONSTRUCTORS AND OTHER TOOLS
- ☐ OPERATOR OVERLOADING, FRIENDS, AND REFERENCES
- ☒ STRINGS
- ☐ POINTERS AND DYNAMIC ARRAYS

### Functions

- ☐ SEPARATE COMPILATION AND NAMESPACES
- ☒ STREAMS AND FILE I/O
- ☒ RECURSION
- ☐ INHERITANCE
- ☐ POLYMORPHISM AND VIRTUAL FUNCTIONS
- ☐ TEMPLATES
- ☐ LINKED DATA STRUCTURES
- ☐ EXCEPTION HANDLING
- ☐ STANDARD TEMPLATE LIBRARY
- ☐ PATTERNS AND UML

**題目說明：** A popular word game involves finding words from a grid of randomly generated letters. Words must be at least three letters long and formed from adjoining letters. Letters may not be reused and it is valid to move across diagonals. As an example, consider the 4x4 grid of letters below.

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P

The word "FAB" is valid (letters in the upper left corner) and the word "KNIFE" is valid. The word "BABE" is not valid because the "B" may not be reused. The word "MINE" is not valid because the "E" is not adjacent to the "N".

Write a program that uses a 4x4 two dimensional array to represent the game board. The program should read the words from the text file words.txt and then use a recursion algorithm to determine if the word may be formed from the letters on the game board. The program should output all valid words from the file that are on the game board.

**輸入說明：** See the Sample Input below, and note that all inputs are lower case letters.

**輸出說明：** See the Sample Output below, and please output to console.

**I/O 範例：**

	Sample Input	Sample Output
第一組測資與輸出	abcd efgh ijkl mnop	abc afb fie fin fink glop ink jim

		knife lop min mink nim pkg plonk pol polk
第二組	aabc defg hijk llmn	abc abed afb baa baaed bad bade bead bed bedim dab deaf deb dei die dill dim fad fade fed fide fie fill film head heil hid hide hie hied hill him idea ill jill jim lid lie lied lief life lim limn

		mid mil mill
第三組	apbc pefg lijk hlmn	ape app apple bel bell belli elhi ell epa fell fie file fill fille film hie hill him hip ill jell jill jim lea leap lei lie lief life lim limn lip mil mile mill mille pap pea pep pie pile pill plea

附屬資料：

☒解答程式：WordGame.cpp(檔名)

☒測試資料：input1.txt, output1.txt, input2.txt, output2.txt, input3.txt, output3.txt, words.txt

☐ 易，僅需用到基礎程式設計語法與結構

☐ 中，需用到多項程式設計語法與結構

☒ 難，需用到多項程式結構或較為複雜之資料型態或結構

解題時間：40 分鐘。

其他註記：無